CLAIMS

1. An optical recording medium, comprising:

a substrate on which information is formed as pit rows constituted by concavities and convexities having a predetermined track pitch;

at least a first metal reflective layer; and

a transparent resin layer formed on the first metal reflective layer, which are formed on the substrate,

wherein the information is reproduced by applying a light beam onto a signal face formed on the resin layer side of the first metal reflective layer,

characterized in that a depth of the shortest pit formed in the signal face is made different from a depth of the longest pit formed therein.

2. The optical recording medium according to claim 1, wherein

at least the first metal reflective layer; and

the transparent resin layer formed on the first metal reflective layer are formed on the substrate in which a depth of the shortest pit and a depth of the longest pit are made equal in the substrate,

characterized in that the following relational expression:

$$1.0 < D(S)/D(L) \leq 1.3$$

is satisfied, provided that a depth of the shortest pit formed in the signal face is D(S) and a depth of the longest pit formed in the signal face is D(L).

3. The optical recording medium according to claim 1, wherein, with respect to the substrate in which a depth of the shortest pit is made greater than a depth of the longest pit in the substrate, supposing that a depth of the shortest pit formed in the signal face formed on the resin layer side of the first metal reflective layer is D(S) and a depth of the longest pit formed in the signal face is D(L), the following relational expression is satisfied:
$1 < D(S)/D(L) \leq 1.3$.

4. The optical recording medium according to claim 1, wherein, supposing that a depth of the shortest pit formed in the signal face formed on the resin layer side of the first metal reflective layer is D(S) and a depth of the longest pit formed in the signal face is D(L), and that, when a tangent line is drawn from a point positioned with a depth of $1/2 \times D(S)$ on the taper face of the shortest pit in the signal face, an angle that is made by the tangent line and a mirror face portion without pits formed therein is defined as $\alpha(S)$, and that, when a tangent line is drawn from a point positioned with a depth of $1/2 \times D(L)$ on the taper face of the longest pit, an angle that is made by the tangent line and a mirror face portion without pits formed

therein is defined as $\alpha(L)$, the following relational expression is satisfied: $\alpha(L) < \alpha(S)$.

5. The optical recording medium according to claim 3 or claim 4, wherein the following relational expression is satisfied: $1.0 < d(L)/d(S) \leq 1.3$, provided that a depth of the shortest pit in the substrate is d(S), and that a depth of the longest pit in the substrate is d(L).

6. The optical recording medium according to any one of claims 1 to 5, wherein the depth D(S) of the shortest pit formed on the signal face satisfies the following relational expression: $\lambda/(5 \times n) < D(S) < \lambda/(3 \times n)$, provided that the wavelength of a light source in the light beam is λ and a refractive index of the transparent resin layer is n.

7. The optical recording medium according to any one of claims 1 to 6, wherein the depth d(S) of the shortest pit length in the substrate is made smaller than D(S) of the shortest pit formed in the signal face so that the depth D(S) is set to a desired value.

8. The optical recording medium according to any one of claims 1 to 7, wherein the depth d(S) of the shortest pit length in the substrate satisfies the following relational expression: $\lambda/(6 \times n) < d(S) < \lambda/(3 \times n)$.

9. The optical recording medium according to any one

of claims 1 to 8, wherein the first metal reflective layer is made of an alloy mainly containing Ag with a weight ratio of Ag being set to not less than 97%.

10. The optical recording medium according to any one of claims 1 to 8, wherein the first metal reflective layer is made of an alloy represented by a composition formula Ag_xM_{1-x}, in which M is at least the one selected from the group consisting of Pd, Cu, Pt, Rh, Nd and Ni and x represents a value of not less than 97% in weight ratio.

11. The optical recording medium according to any one of claims 1 to 8, wherein the first metal reflective layer is made of Ag or an alloy material mainly containing Ag, with the layer thickness being set in a range from not less than 10 nm to not more than 75 nm.

12. The optical recording medium according to any one of claims 1 to 8, wherein the first metal reflective layer is made of Al or a metal material mainly containing Al, with the layer thickness being set in a range from not less than 7 nm to not more than 50 nm.

13. The optical recording medium according to any one of claims 1 to 12, wherein the track pitch is set in a range from not less than 0.24 μm to not more than 0.36 μm and the shortest pit length is set in a range from not less than 0.14 μm to not more than 0.21 μm.

14. The optical recording medium according to any one

of claims 1 to 13, which is reproduced by an optical recording medium reproducing apparatus provided with an optical system in which the wavelength λ of the light beam from light source is set in a range from not less than 400 nm to not more than 410 nm and the numerical aperture NA of the objective lens is set in a range from not less than 0.84 to not more than 0.86.

15. A manufacturing method for an optical recording medium in which a light beam is applied to a signal face so that information is reproduced, comprising;

recording information on a substrate by forming pit rows constituted by concavities and convexities with a predetermined track pitch in which a depth d(S) of the shortest pit in the substrate satisfies a range represented by $\lambda/(6 \times n) < d(S) < \lambda/(3 \times n)$;

forming a metal reflective layer on the substrate as a signal face so that the depth of the shortest pit is made different from a depth of the longest pit; and

forming a transparent resin layer on the metal reflective layer.

16. The manufacturing method for an optical recording medium according to claim 15, wherein the metal reflective layer is deposited and formed through an ion beam sputtering process, with the layer-forming time being set to not more than 1 s.

17. The manufacturing method for an optical recording medium, according to claim 15, wherein the metal reflective layer is formed through a magnetron sputtering process and an Ar pressure at the time of forming the layer is set in a range from not less than 0.2 Pa to not more than 0.7 Pa, with the layer-forming time being set to not more than 3 s.